Calendar No. 1058

100TH CONGRESS *2d Session*	SENATE	REPORT 100-586

CONVEYANCE OF THE VESSEL "LANE VICTORY"

Mr. HOLLINGS, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

OF THE

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ON

H.R. 2032

OCTOBER 3 (legislative day, SEPTEMBER 26), 1988.—Ordered to be printed

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U.S. GOVERNMENT PRINTING OFFICE
29-010 WASHINGTON : 1988

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

S263-25

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Calendar No. 1058

100TH CONGRESS
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REPORT
100–586

CONVEYANCE OF THE VESSEL "LANE VICTORY"

OCTOBER 3 (legislative day, SEPTEMBER 26), 1988.—Ordered to be printed

Mr. HOLLINGS, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

[To accompany H.R. 2032]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (H.R. 2032) to authorize the conveyance of the vessel, Lane Victory, having considered the same, reports favorably thereon without amendment and recommends that the bill do pass.

PURPOSE OF THE LEGISLATION

The purpose of H.R. 2032 is to authorize the conveyance of a U.S. Government-owned vessel to a non-profit corporation for use as a merchant marine memorial.

BACKGROUND AND NEEDS

This legislation is necessary to permit the conveyance of a U.S. Government-owned vessel currently laid up in the National Defense Reserve Fleet [NDRF] to a non-profit organization at no cost to the Government.

The bill authorized the conveyance of the *Lane Victory* (U.S. official number 248094) to a non-profit corporation for use as a merchant marine memorial.

The *Lane Victory* is a World War II Victory-class vessel, built in 1945 in Los Angeles, California. She is 439 feet in length, 7,638 gross tons, 5,193 net tons, and powered by a steam turbine engine of 6,000 shaft horsepower.

As of the time of this report, only one non-profit organization, the U.S. Merchant Marine Veterans of World War II, has expressed a desire to assume full financial and operational responsibility for the vessel for use as a merchant marine memorial. In

January 1985, the organization was incorporated as a non-profit, mutual benefit corporation, organized under the laws of the State of California. At the present time, the organization consists of chapters in seven States, with a total membership of about 400 persons. Its purposes are: to inform and educate the American people about the role played by our merchant marine in World War II; to provide an appropriate memorial for merchant seamen; to promote and foster the American merchant marine; and to achieve recognition for merchant seamen who served during World War II.

The U.S. Merchant Marine Veterans of World War II proposes to establish a permanent memorial museum in Los Angeles Harbor, dedicated to the memory of the thousands of merchant seamen who lost their lives during World War II. As of January 1986, the organization had assets of $5,000 derived from membership dues and donations. It is actively securing pledges of financial support from corporations and private foundations, contingent upon assignment of the vessel to the organization.

The vessel would be manned by volunteer members of the organization who have the necessary credentials and experience. The organization would fully comply with the inspection and certification requirements of the Coast Guard and the American Bureau of Shipping. Its members have always recognized that this might prove to be a rather expensive undertaking, since the vessel has not been operational for 20 years and is more than 40 years old.

The organization contemplates sailing the vessel within Los Angeles Harbor three or four times a year. By carrying paying guests during these trips, the organization hopes to generate considerable income. This would help to defray ongoing administrative and maintenance expenses. It is also aware of the fact that, to carry passengers for hire (regardless of its non-profit corporate status), the organization would in all likelihood be required to comply with extensive Coast Guard regulations and standards.

The organization has stated that it would enter into an indemnity and hold harmless agreement to protect the Government from all liability claims, particularly relating to asbestos and toxic substances.

LEGISLATIVE HISTORY

H.R. 2032 passed the House of Representatives unanimously on March 8, 1988, and was referred to this Committee on March 14, 1988. The Committee considered the bill in open Executive Session and ordered the legislation reported without objection and without amendment on September 20, 1988.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, September 22, 1988.

Hon. ERNEST F. HOLLINGS,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed H.R. 2032, an act to authorize the conveyance of the vessel Lane Victory, as ordered reported by the Senate Committee on Commerce, Science, and Transportation, September 20, 1988. Enactment of H.R. 2032 is not expected to result in any cost to the federal government, or to state or local governments.

H.R. 2032 would permit the Secretary of Transportation to convey the Lane Victory to a non-profit corporation for use as a merchant marine memorial.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Deborah Reis, who can be reached at 226–2860.

Sincerely,

JAMES L. BLUM,
Acting Director.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported.

Because H.R. 2032 does not create any new programs, the legislation will have no additional reporting impact, and will result in no additional reporting requirements. The legislation will have no further effect on the number or types of individuals and businesses regulated, the economic impact of such regulation, the personal privacy of affected individuals, or the paperwork required from such individuals and businesses.

SECTION-BY-SECTION ANALYSIS

Section 1

Section 1(a) authorizes the Secretary of Transportation (Secretary) to convey the right, title, and interest of the U.S. Government in the vessel *Lane Victory* U.S. official number 248094) to a nonprofit corporation for use as a merchant marine memorial if the recipient agrees: to use the vessel as a nonprofit merchant marine memorial museum; not to use the vessel for commercial (as opposed to non-profit) transportation purposes; to make the vessel available to the Government when needed; to reconvey and deliver the vessel to the Government when no longer required for use as a merchant marine memorial museum; and to any other conditions the Secretary considers appropriate. The Committee intends that paragraph (6) of subsection (a) serve to authorize the Secretary to require, *inter alia,* that the recipient take all steps necessary to satisfy the Secretary that the recipient will hold the Government harmless under paragraph (5), including the posting of financial se-

curity satisfactory to the Secretary to assure that the hold harmless agreement is effective.

Section 1(b) requires delivery to the recipient at the place the vessel is located on the date of enactment of this legislation, in its present condition, at no cost to the Government.

Section 1(c) authorizes the Secretary to convey any unneeded equipment from other vessels in the NDRF in order to assist in placing *Lane Victory* in operating condition.

Section 2

Section 2 requires the Secretary to make the vessel available under the conditions of the legislation for a period of no longer than 2 years from the date of enactment.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee states that the bill as reported would make no change to existing law.

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Calendar No. 1061

100TH CONGRESS *2d Session*	Senate	REPORT 100-587

NATIONAL SCIENCE AND TECHNOLOGY POLICY AMENDMENTS OF 1988

Mr. HOLLINGS, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

OF THE

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ON

S. 2614

OCTOBER 4 (legislative day, SEPTEMBER 26), 1988.—Ordered to be printed

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U.S. GOVERNMENT PRINTING OFFICE

29-010 WASHINGTON : 1988

S263-26

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

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Calendar No. 1061

100TH CONGRESS
2d Session

SENATE

REPORT
100-587

NATIONAL SCIENCE AND TECHNOLOGY POLICY AMENDMENTS OF 1988

OCTOBER 4 (legislative day, SEPTEMBER 26), 1988.—Ordered to be printed

Mr. HOLLINGS, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

[To accompany S. 2614]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 2614) to amend the National Science and Technology Policy, Organization, and Priorities Act of 1976 in order to provide for improved coordination of national scientific research efforts and to provide for a national plan to improve scientific understanding of the Earth system and the effect of changes in that system on climate and human well-being, having considered the same, reports favorably thereon with an amendment in the nature of a substitute and recommends that the bill do pass.

PURPOSE OF THE BILL

The purpose of this bill is to improve coordination among Federal agencies conducting research on greenhouse warming, ozone layer depletion, and other aspects of "global change" and to develop and implement a 10 year, interagency global change research plan.

BACKGROUND AND NEEDS

In recent years, scientists have observed major changes in the earth's atmosphere, oceans, and land masses. These changes include rising world temperatures, possible shifts in climate zones, depletion of the stratospheric ozone layer that shields the planet from harmful radiation, and possible rises in sea levels. If these global changes continue, they will have profound and lasting effects. Steady increases in world temperatures could create drought

and dust bowl conditions in many areas of the world. Depletion of stratospheric ozone could lead to thousands of new cases of skin cancer each year. Rising sea levels could permanently flood many coastal communities.

Scientists believe that human activities, such as the burning of fossil fuels, the use of certain chemicals, and the mass destruction of forests, have contributed to these new global changes. In some cases, existing scientific knowledge of these events is adequate to allow policymakers to make sound decisions. The known relationship between chlorofluorocarbons, a class of refrigerants, and the depletion of the stratospheric ozone layer led government officials to reach an international agreement, the Montreal Protocol, to limit production, emission, and trade of these compounds. Domestic regulations also have been proposed to restrict their use.

Major scientific uncertainties exist, however, regarding most aspects of global change. Today, for example, scientists do not know whether the drought in the Midwest and heat wave of the summer of 1988 were one-time events or are part of a long-term shift toward hotter, drier summers. The following urgent questions also are unanswered: To what extent is the new trend in global warming due to natural factors and to what extent due to human activities? Is the carbon dioxide created by burning fossil fuels the main reason for global warming, or, are other gases from other sources more important? How would a persistent rise in world temperatures affect our climate and agriculture? How much has the stratosphere's protective layer of ozone been destroyed, and, can natural processes replenish it? If the Earth does warm in the decades ahead, how far will sea levels rise and which coastal areas will be inundated?

Policy makers considering new laws and regulations to cope with global change need better answers to these important questions.

The scientific community, both in the United States and worldwide, has begun the research needed to answer these urgent questions. New technologies, such as remote sensing satellites and supercomputers to analyze data and run numerical models, offer a major new opportunity to study the entire earth as a single, complex system, with the interaction of the atmosphere, oceans, land masses, and human activities. In a major report, the Earth System Sciences Committee [ESSC] of the National Aeronautical and Space Administration's [NASA] Advisory Council concluded that new technology now offers scientists a major opportunity to understand these complex relationships affecting the planet. This research will involve scientists from dozens of disciplines, including physics, climatology, oceanography, geology, and computer science.

Because of its broad scope, global change research will involve researchers in many Federal agencies, labs, and universities, both here and abroad. An effective research program will require an unprecedented degree of scientific cooperation, coordination, and planning.

International scientific cooperation has begun through the creation of the International Geosphere and Biosphere Program [IGBP]. Developed by the International Council of Scientific Unions, this long-term program is designed to begin in the early 1990s. Its specific purpose will be "to describe and understand the

interactive physical, chemical, and biological processes that regulate the total Earth system, the unique environment that it provides for life, the changes that are occurring in this system, and the manner in which they are influenced by human actions." The IGBP will attempt to provide the fundamental knowledge needed to permit an assessment of likely changes on the Earth over the next 100 years. It also will provide much needed coordination of world research efforts.

Research within the United States also needs improved coordination. Coordination is needed not only to eliminate unnecessary duplication of efforts and ensure that gaps in our research are filled but also to establish and operate large research projects and experiments which draw on many groups. For example, a single research project might involve the following: collection of environmental data from satellites, airplanes, and ships run by the National Oceanic and Atmospheric Administration [NOAA] and NASA; focused research projects by scientists from NOAA and NASA, or funded by the National Science Foundation [NSF]; and facilities and equipment provided by NSF, private industry, and the Department of Defense.

Scientists and Government officials within the United States now recognize the need for improved research coordination. Scientists working through the National Research Council [NRC], the operating arm of the National Academy of Sciences, have produced several reports on global change and are developing a comprehensive research agenda which will also outline the U.S. role in IGBP.

Federal officials recently have begun to improve interagency coordination. The task is complex. While the Federal investment in direct research on global change was small before fiscal year [FY] 1988, total funding for related activities in areas such as atmospheric research, climate forecasting, and satellite development may exceed $1 billion in FY 1989. These "contributing activities" provide essential information and support services to programs of focused research on global change. According to the Office of Management and Budget [OMB], eight Federal agencies requested $97,500,000 dollars for focused global change research and $912 million for contributing activities in FY 1989.

Earlier this year, NASA's ESSC completed comprehensive recommendations for defining and coordinating Federal agency missions in the field of global change research. Rather than proposing the establishment of a new agency, the ESSC suggested building on the existing programs of NASA, NOAA, and NSF, with contributions from the research programs of other agencies. The Committee recognizes and commends the efforts of the ESSC in developing those recommendations. The roles of these three agencies in a national global change research program should be consistent with ongoing missions and responsibilities.

NSF currently is charged with maintaining the health of basic research in all of the earth science disciplines. In addition, NSF has become an active sponsor and coordinator for many national and international multi-disciplinary global research programs. Through such activities as its Global Geosciences Program, NSF is planning and currently implementing coordinated interagency *in situ* field sampling programs which will provide the ground-based

component to the U.S. Earth observing satellite missions planned for the 1990's.

NASA's primary responsibility is for earth sciences research missions from space, mission planning, satellite instrument development, and a supporting program of basic research. NASA will continue to support enhanced research and analysis programs and expand recently initiated interdisciplinary research programs. NASA will also coordinate proposed international satellite observational programs and complete approved satellite missions including the Upper Atmospheric Research Satellite, the Ocean Topography Experiment [TOPEX/POSEIDON], and the International Solar Terrestrial Physics Program. Further, NASA is proposing an earth observing system which would use the polar platforms being developed as part of the international space station.

NOAA is looked to as the principal operational, observational, prediction, and information management agency for the national global change effort. NOAA's unique role is derived from its statutory responsibility to predict climate change and to provide related data, information, and services to the public, the private sector, the research community, and other Federal agencies. In FY 1989, NOAA plans to initiate a new program in Climate and Global Change that incorporates long-term observations, development and use of predictive models, supporting research, and information management. Given the mission and capabilities of NOAA, it is clear that the agency should play a larger role in national global change research efforts.

In April 1987, under guidance from OMB and the White House Office of Science and Technology Policy [OSTP], the Federal Coordinating Council for Science, Engineering, and Technology [FCCSET] formed a Committee on Earth Sciences [CES] to coordinate Federal global change research. FCCSET was established by the National Science and Technology Policy, Organization, and Priorities Act of 1976 (Science Act). It is chaired by the President's Science Advisor and consists of representatives from those Federal departments and agencies engaged in scientific research.

The purpose of CES is to increase the overall effectiveness and productivity of Federal research and development efforts directred toward an understanding of the Earth as a global system. In pursuing that objective, CES is following the general approach set forth by the ESSC; it endeavors to improve coordination among the global change research programs of existing Federal agencies. CES also works closely with the National Research Council. Departments and agencies which are members of the CES include the Departments of Commerce and Interior, NSF, NASA, OMB the National Climate Program Office, the Environmental Protection Agency [EPA], the Council on Environmental Quality, and the White House Policy Office. CES has made steady progress toward establishing interagency coordination and defining a coherent, comprehensive Federal program of global change research.

Interagency research effort would be strengthened, however, by establishing a formal statutory global change research planning process. This planning process would create a stable framework for the long-term research that is needed to help answer difficult scientific questions about global change and to provide government offi-

cials and citizens with the information that they will need to make informed policy choices.

Legislative History

During the 100th Congress, the Commerce Committee held two hearings on the issue of global change research. A hearing on July 16, 1987, focused on the research programs of three agencies: NSF, NOAA, and NASA. Senator Hollings introduced S. 2614 on July 7, 1988, and a second hearing was held on July 13, 1988 to discuss S. 2614 as well as future global change research needs and priorities. At the hearings, several prominent scientists, including researchers from NSF, NOAA, and NASA, testified that the threat posed by greenhouse warming and ozone layer depletion is serious and real. They all agreed that more global change research was needed as was a broad, long-term research program whose goals are set by scientists with advice from policymakers.

On September 20, 1988, the Committee, without objection, ordered S. 2614 reported with an amendment in the nature of a substitute. The language of the substitute reported by the Committee is very similar to the text of S. 2614 as it was introduced, although it included a number of small changes to the original bill.

Summary of Major Provisions

As reported, S. 2614 would amend the Science Act. The bill provides for the development and implementation of long-term interagency research plans under the authority of FCCSET.

In addition, the bill would require FCCSET to develop and oversee the implementation of a 10-year national global change research plan. In carrying out that responsibility, FCCSET would:

—Establish national goals and priorities for global change research, working with the NRC and other research groups;

—Define the roles of each agency and department in implementing the plan by building on their existing missions and responsibilities;

—Review each agency budget estimate in the context of national goals, using budget information provided by the agencies and OMB; and

—Submit an annual report to Congress, regarding progress in implementing the national research plan.

Estimated Costs

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, September 22, 1988.

Hon. ERNEST F. HOLLINGS,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC 20510.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed S. 2614, the National Science and Technology Policy Amendments of 1988, as ordered reported by the Senate Committee on Commerce, Science, and Transportation, September 20, 1988.

Based on information provided by the U.S. Geological Survey, CBO estimates that enacting S. 2614 would result in no significant costs to the federal government, or to any state or local government. The bill would require the Federal Coordinating Council on Science, Engineering, and Technology [FCCSET] to prepare a National Global Change Research Plan, and to report annually to the Congress and the President on the status of the plan. Because these activities are similar to FCCSET's ongoing activities, CBO expects that FCCSET could complete them at no significant additional cost to the government.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Michael Sieverts, who can be reached at 226-2860.

Sincerely,

JAMES L. BLUM,
Acting Director.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported.

NUMBER OF PERSONS COVERED

This legislation improves coordination between Federal agencies doing global change research and mandates a 10-year, national global change research plan. It does not require new regulations. The legislation will not directly affect the number of persons involved in global change research.

ECONOMIC IMPACT

This legislation authorizes no new Federal spending. By providing for better interagency coordination and cooperation, it should improve the effectiveness of research funds now spent on global change research. The mandated interagency research plan should prevent unnecessary duplication of effort and promote the sharing of research data between agencies.

PRIVACY

This legislation will not have any adverse impact on the personal privacy of the individuals affected.

PAPERWORK

This legislation requires a 10-year research plan which is to be revised at least once every three years. It also requires that FCCSET prepare and submit an annual report to Congress on implementation of this legislation.

SECTION-BY-SECTION ANALYSIS

SECTION 1.—SHORT TITLE

This section provides the short title, the "National Science and Technology Policy Amendments of 1988".

SECTION 2

This section, and those which follow, would amend the Science Act. Section 2 of the bill would amend section 102(a) of the Science Act, which identifies the principles that form the basis for national science and technology policy. The list of principles would be expanded to emphasize the need for comprehensive long-term planning of research to address complex scientific issues of national and international concern. The purpose of such planning would be to ensure a scientific basis for policy decisions.

SECTION 3

This section would amend section 401 of the Science Act, which establishes and defines the responsibilities, of FCCSET. As the government's interagency committee for science, FCCSET is currently charged with addressing scientific issues which affect more than one agency and with developing recommendations for resolving those issues. Section 3 of the reported bill would provide FCCSET with new authority to develop and coordinate plans for interagency research. Such plans would identify critical research needs, and provide for cooperation among government, industry, and academic scientists in the United States and overseas. Finally, this section adds the development of interagency plans to the purposes for which FCCSET subcommittees and panels may be formed.

SECTION 4

This section adds a new title VI, entitled "National Global Change Research Plan", at the end of the Science Act. Title VI would mandate development of a comprehensive 10-year plan for Federal global change research.

New section 601 states that title VI may be cited as the "National Global Change Research Act of 1988".

New section 602 outlines the findings and purpose of title VI. The findings recognize that human activities could result in worldwide changes in the global environment, including ozone layer depletion, sea level rise, and global climate shifts. The findings also outline possible serious and adverse impacts of such changes and to emphasize the importance of improved scientific understanding in developing effective policies to deal with global change. Finally, this new section notes recent scientific advancements, ongoing efforts to develop a national program, and the leadership of the

United States in global change research. The purpose of title VI is to ensure that needed research efforts are ongoing so as to assist the United States and the world in understanding and coping with global change.

New section 603 instructs the President, through FCCSET, to develop a 10-year National Global Change Research Plan. The plan would be delivered to Congress within 1 year and revised at least once every 3 years. The plan would establish goals and priorities for a Federal research program, define roles for each agency in meeting those goals, and recommend funding levels for Federal activities necessary to implement the plan. The relevant programs of the eight listed Federal agencies and departments would be considered in developing the plan, as well as any others deemed appropriate.

Subsection (b) of new section 603 details FCCSET's responsibilities regarding global change research activities. FCCSET would serve as the lead entity responsible for overseeing implementation of the 10-year plan and would coordinate research efforts by Federal agencies. FCCSET would also review agency budget estimates for global change research, and provide the results of that review to OMB. Finally, FCCSET would work with scientists outside the Federal Government and coordinate Federal interagency participation in international research and assessment activities.

Section 603(c) identifies research elements to be considered in the national plan, including worldwide monitoring systems, methods for detecting global change, predictive models, and information management. Subsection (d) of this section describes the existing missions of six agencies which could form the core of a national research program. NSF would be responsible for basic research in earth sciences. NASA would have primary responsibility for earth science missions from space. NOAA would continue to be responsible for operational environmental satellite programs, research on ocean and atmospheric processes, and environmental data management. The U.S. Geological Survey would have primary responsibility for geological and hydrologic studies and mapping. EPA would have responsibility for assessing the environmental consequences of global change. The Department of Energy would have responsibility for research on carbon dioxide emissions and research to establish a comprehensive national energy policy. By summarizing the agencies' existing roles, the Committee intends to ensure that existing agency programs are incorporated into the national global change program. It is not the Committee's intention to restrict the type of research activities which any of these agencies may pursue in the future.

The research plan would provide for interagency collaboration to develop information systems and models needed to study the Earth system. At present, an enormous amount of weather and environmental information which could be used to study global environmental change is collected by satellites and by ground monitoring systems. In the future, this flow of data is expected to increase dramatically. OSTP estimates that over the next decade, the amount of data from satellites alone will increase from 100 billion bits per day to over 10 trillion bits per day. The Committee recognizes that data management and archiving systems must be in place to proc-

ess, distribute, and store this information, if it is to be available to researchers.

Finally, new section 603 would direct each Federal agency and department involved in global change research to submit, with its annual budget request to OMB, a report indicating which parts of its budget are required to implement the National Global Change Research Plan. OMB would then review each budget request and take into account an agency's contributions to global change research.

New section 604 would define the relation of the National Global Change Research Act to two existing laws, the National Climate Program Act and the Global Climate Protection Act. With respect to the first, Federal officials are directed to ensure that relevant research activities of the National Climate Program are considered in developing national global change research efforts. With respect to the second, FCCSET and the agencies represented on FCCSET would provide their research findings to EPA for use in formulating a strategy for minimizing global climate change.

New section 605 would require FCCSET to submit to the President and Congress an annual report describing global change research activities in the preceding fiscal year. The report would summarize the research plan, any changes made to it, and agency budgets for global change activities. The report would also include recommendations for additional legislation or action needed to improve effectiveness of national global change research efforts.

Changes in Existing Law

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new material is printed in italic, existing law in which no change is proposed is shown in roman).

National Science and Technology Policy, Organization, and Priorities Act of 1976

Section 102 of that Act

Sec. 102. (a) Principles.—In view of the foregoing, the Congress declares that the United States shall adhere to a national policy for science and technology which includes the following principles:

(1) through (5) * * *

[(6) The recognition that, as changing circumstances require periodic revision and adaptation of title I of this Act, the Federal Government is responsible for identifying and interpreting the changes in those circumstances as they occur, and for effecting subsequent changes in title I as appropriate.]

(6) The development and implementation of long-range, interagency research plans to support policy decisions regarding identified national and international concerns, and for which a sustained and coordinated commitment to improving scientific understanding will be required.

(b) through (c) * * *

Section 401 of that Act

ESTABLISHMENT AND FUNCTIONS

SEC. 401. (a) * * *
(b) through (e) * * *
(f) The Council may be assigned responsibility for developing long-range and coordinated plans for scientific and technical research which involve the participation of more than two Federal agencies. Such plans shall—

(1) identify research approaches and priorities which most effectively advance scientific understanding and provide a basis for policy decisions;

(2) provide for effective cooperation and coordination of research among Federal agencies; and

(3) encourage domestic and, as appropriate, international cooperation among government, industry, and university scientists.

[(f)]*(g)* * *
[(g)]*(h)* * *
[(h)] [*(i)* For the purpose of *developing interagency plans,* conducting studies and making reports as directed by the Chairman, standing subcommittees and panels of the Council may be established. Among such standing subcommittees and panels of the Council shall be the Subcommittee on Food, Agriculture, and Forestry Research. This subcommittee shall review Federal research and development programs relevant to domestic and world food and fiber production and distribution, promote planning and coordination of this research in the Federal Government, and recommend policies and other measures concerning the food and agricultural sciences for the consideration of the Council. The subcommittee shall include, but not be limited to, representatives of each of the following departments or agencies; the Department of Agriculture, the Department of State, the Department of Defense, the Department of the Interior, the Department of Health and Human Services, the National Oceanic and Atmospheric Administration, the Department of Energy, the National Science Foundation, the Environmental Protection Agency, and the Tennessee Valley Authority. The principal representatives of the Department of Agriculture shall serve as the chairman of the subcommittee.

New Title VI of that Act

TITLE VI—NATIONAL GLOBAL CHANGE RESEARCH PLAN

SHORT TITLE

SEC. 601. This title may be cited as the "National Global Change Research Act of 1988".

FINDINGS AND PURPOSE

SEC. 602. (a) Congress finds and declares the following:

(1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to

processes of global change that may significantly alter our habitat within a few human generations.

(2) Such human-induced changes may lead to significant global warming and the depletion of stratospheric ozone, and thus have the potential to alter world climate patterns, increase global sea levels, and reduce the ability of the atmosphere to screen out harmful ultraviolet radiation. Over the next century, the consequences could seriously and adversely affect world agricultural and marine production, coastal habitability, regional economic well-being, human health, and biological diversity;

(3) Development of effective policies to mitigate and cope with human-induced global changes will rely on greatly improved scientific understanding of global environmental processes and on our ability to distinguish between the effects of human activities on one hand and the results of natural change on the other.

(4) New developments in interdisciplinary Earth sciences, global observing systems, and computing technology make possible significant advances in the scientific understanding and prediction of these global changes and their effects.

(5) Efforts are ongoing in several Federal agencies which could contribute to a well-defined and coordinated national program of research, monitoring, assessment, information management, and prediction.

(6) The United States, as a world leader in Earth system science, should continue to provide leadership in developing and implementing an international global change research program.

(b) It is the purpose of Congress in this title to provide for a national global change research plan which when implemented will assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.

NATIONAL GLOBAL CHANGE RESEARCH PLAN

SEC. 603. (a)(1) The President, through the Council, shall develop a National Global Change Research Plan (hereinafter in this title referred to as the "Plan") in accordance with section 401(f) of this Act and the provisions, findings, and purpose of this title. Consistent with the responsibilities set forth under subsection (d) of this section, the Plan shall contain recommendations for a 10-year national research effort, to be submitted to Congress within one year after the date of enactment of this title and to be revised at least once every three years thereafter.

(2) The Plan shall—

(A) establish the goals and priorities for Federal global change research for the 10-year period beginning in the year the Plan (or revised Plan) is submitted;

(B) set forth the role of each Federal agency and department in implementing the Plan;

(C) describe the levels of Federal funding and specific activities, including research activities, data collection and analysis requirements, predictive modeling, participation in international research efforts, and information management, required to achieve such goals and priorities; and

(D) consider and utilize, as appropriate, reports and studies conducted by Federal agencies and departments, the National Research Council, or other entities.

(3) The Plan shall address, where appropriate, the relevant programs and activities of the following Federal agencies and departments:

(A) the Department of Commerce, particularly the National Oceanic and Atmospheric Administration;

(B) the National Science Foundation;

(C) the National Aeronautics and Space Administration;

(D) the Department of Interior, particularly the United States Geological Survey;

(E) the Department of Energy;

(F) the Department of Agriculture;

(G) the Environmental Protection Agency;

(H) the Department of Defense, particularly the Department of the Navy; and

(I) such other research agencies and departments as the President or the Chairman of the Council considers appropriate.

(b) The Council shall—

(1) serve as lead entity responsible for oversight of the implementation of the Plan;

(2) coordinate the global change research activities of Federal agencies and departments and report at least annually to the President, through the Chairman of the Council, on any recommended changes in agency or departmental roles that are needed to better implement the Plan;

(3) prior to the President's submission to Congress of the annual budget estimate, review each agency budget estimate in the context of the Plan and make the results of that review available to each agency and to the appropriate elements of the Executive Office of the President, particularly the Office of Mangement and Budget;

(4) work with Federal agencies, the National Research Council and with academic, State, and other groups conducting research and assessments of global changes and their effects;

(5) coordinate Federal interagency participation in international activities related to global change research and assessment; and

(6) consult with actual and potential users of such research and assessments.

(c) The Plan shall provide for, but not be limited to, the following research elements:

(1) Global measurements, establishing worldwide observations necessary to understand the physical, chemical, and biological processes responsible for changes in the Earth system on all timescales.

(2) Documentation of global change, including the development of mechanisms for recording changes that will actually occur in the Earth system over the coming decades.

(3) Studies of earlier changes in the Earth system, using evidence from the geological and fossil record.

(4) Predictions, using quantitative models of the Earth system to identify and simulate global trends.

(5) Development of an information base, the assembly of the information essential for effective decision-making to respond to the consequences of global change.

(6) Basic research directed toward improving scientific understanding of specific aspects of the Earth system.

(d)(1) The Plan shall take into consideration, but not be limited to, the following existing agency missions, and responsibilities:

(A) The National Science Foundation shall continue to be responsible for basic research in all areas of Earth, atmospheric, and ocean science, including the relevant biological sciences. Such basic research may include ground-based measurements for regional and global studies; polar studies; large-scale field programs; interpretation and use of space-based data; theoretical and laboratory studies; research facilities support; and development of numerical models, information and communication systems, and data bases.

(B) The National Aeronautics and Space Administration shall have primary responsibility for Earth science research missions from space, including those of broad scientific scope, to study the Earth as an integrated whole. Associated efforts may include related ground studies; remote-sensing and advanced instrument develpment; and improvement of techniques for the transmission, processing, archiving, retrieval, and use of data and related models; and other research activities.

(C) The National Ocecnic and Atmospheric Administration shall continue to be responsible for operational environmental satellite programs and research programs on ocean and atmospheric processes. Additional responsibilities shall include climate diagnostics and prediction; development of predictive models and techniques for detecting natural and human-made changes; acquisition, maintenance, and distribution of long-term data bases; calibration and validation of environmental observations; processing and archiving of space-based and ground-based data; and development and support of ground-based oceanic and atmospheric monitoring systems.

(D) The United States Geological Survey shall have primary responsibility for geological studies and mapping. Additional areas of responsibility shall include paleoclimate, hydrologic cycles, geographical information systems, and management of land remote-sensing data, including acquisition, maintenance, and distribution of long-term data bases for these areas.

(E) The Environmental Protection agency shall have primary responsibility for research to assess and evaluate the ecological and environmental consequences of global change, including the interaction of plant and animal communities and ecosystems. Additional areas of responsibility shall include evalautions of the impact of global atmospheric change on regional air and water quality, development of emission factors, and inventories for important trace gases other than carbon dioxide.

(F) The Department of Energy shall have primary responsibility for research on atmospheric carbon dioxide emission measurement and research to establish a comprehensive national energy policy for reducing carbon dioxide and other trace gas emissions. Associated efforts may include assessment and appli-

cation of predictive models, evaluation of the climatic effects of various energy policy options, and research on industrial sources of trace gases.

(2) The Plan shall reflect the need for collaboration among agencies with respect to—

(A) the establishment and development of an information system for Earth system science; and

(B) basic research into the development of new conceptual and numerical models of the Earth system.

(e) The Chairman of the Council and the Secretary of State shall cooperate in—

(1) providing representation at international governmental meetings and conferences on global change in which the United States participates; and

(2) coordinating the Federal activities of the United States with the global change research and assessment programs of other nations and international agencies and organizations, including the World Meteorological Organization and the United Nations Environmental Program.

(f) Each Federal agency and department involved in global change research shall, as part of its annual request for appropriations to the Office of Management and Budget, submit a report identifying each element of its proposed global change activities, which—

(1) specifies whether each such element (A) contributes primarily to the implementation of the Plan or (B) contributes primarily to the achievement of other objectives but aids Plan implementation in important ways; and

(2) states the portion of its request for appropriations that is allocated to each such element.

The Office of Management and Budget shall review each such report in light of the goals, priorities and agency responsibilities set forth in the Plan, and shall include, in the President's annual budget estimate, a statement of the portion of each agency or department's annual budget estimate that is allocated to each element of such agency or department's global change activities. The Office of Management and Budget shall ensure that a copy of the President's annual budget estimate is transmitted to the Chairman of the Council at the same time as such budget estimate is submitted to Congress.

RELATION TO OTHER LAWS

SEC. 604. (a) The President, the Chairman of the Council, and the Secretary of Commerce shall ensure that relevant research activities of the National Climate Program, established by the National Climate Program Act (15 U.S.C. 2901 et seq.), are considered in developing national global change research efforts.

(b) The President, the Chairman of the Council, and the heads of the agencies represented on the Council shall ensure that the research findings of the Council and of Federal agencies and departments are available to the Environmental Protection Agency for use in the formulation of a coordinated national policy on global climate change pursuant to section 1103 of the Global Climate Protection Act of 1987 (15 U.S.C. 2910, note).

ANNUAL REPORT

SEC. 605. The Chairman of the Council shall prepare and submit to the President and Congress, not later than January 31 of each year, an annual report on the activities conducted pursuant to this title during the preceding fiscal year, including—

(1) a summary of the achievements of Federal global change research efforts during that preceding fiscal year;

(2) an analysis of the progress made toward achieving the goals and objectives of the Plan;

(3) a copy or summary of the Plan and any changes made in such Plan;

(4) a summary of agency budgets for global change activities for that preceding fiscal year; and

(5) any recommendations regarding additional action or legislation which may be required to assist in achieving the purposes of this title.

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